

# Factors Associated with Intention and Attempt to Quit: A Study among Current Smokers in a Rural Community of West Bengal

Aparajita Dasgupta, Pritam Ghosh, Bobby Paul, Soumit Roy, Sauryadripta Ghose, Akanksha Yadav

Department of Preventive and Social Medicine, All India Institute of Hygiene and Public Health, Kolkata, West Bengal, India

## Abstract

**Context:** Tobacco smoking is one of the preventable causes of death. Global Adult Tobacco Survey 2 report showed that 19% Indian males were current smokers. It is important to find out factors which help smokers on smoking cessation, ultimately to prevent of lung and other morbidities. There are few community-based studies on intention and attempt to quit smoking in rural area. **Aims:** The present study aimed to determine the factors associated with intention and attempt to quit smoking among current smokers. **Settings and Design:** A cross-sectional study was conducted from June to September 2019 among 198 male daily smokers residing in the rural field practice area of AIHH and PH, Kolkata. **Subjects and Methods:** After cluster sampling, data were collected by predesigned schedule by the face-to-face interview. **Results:** 151 (76.3%) study subjects intended to quit smoking. 63 (31.8%) study subjects attempted to quit in last 1 year. Thirty-one (47.5%) showed high-to-medium nicotine dependence. There was a significant association of intention to quit with agriculture as occupation (acquisitive crime [AOR]-2.17, confidence interval [CI]-1.01-4.63), low nicotine dependence (AOR-2.98, CI-1.43-6.21), doctor's advice (AOR = 2.84, CI-1.27-6.33), and family pressure (AOR = 2.16, CI-1.07-4.38). Attempt to quit was significantly associated with low nicotine dependence (AOR = 5.85, CI-2.85-12.00), family pressure (AOR = 2.94, CI-1.47-5.91). **Conclusion:** Along with counseling to reduce nicotine dependence, comprehensive approach both from family members as well as health care providers, is vital to escalate the quitting behaviour in smoking habit.

**Keywords:** Attempt to quit, intention to quit, nicotine dependence, smokers, tobacco

## INTRODUCTION

Tobacco smoking is one of the age-old social habits that affects the health of a community as a whole.<sup>[1]</sup> In India, nearly one million deaths per annum are attributed to smoking.<sup>[2]</sup> Various organic and inorganic materials in tobacco affect the lung, cause inflammation of blood vessels leading to cardiovascular, cerebrovascular diseases as well as cancers.<sup>[3-6]</sup> India is home to the world's second largest number of tobacco users.<sup>[7]</sup> The Government of India, a signatory of Framework Convention on Tobacco Control, made an optimistic onslaught to tobacco consumption by initiating the National Tobacco Control Program (NTCP) and starting off with mobile-based mCessation initiative, the latter being a harbinger of good news for people wanting to quit.<sup>[8-13]</sup> Despite all these efforts, Global Adult Tobacco Survey (GATS 2015-16) showed that 19% Indian males were current smokers. Nearly half of them had no intention to quit and only one-third attempted to quit.<sup>[14]</sup> In-depth introspection of tobacco quitters be will help to make robust and forceful strategies to give support to tobacco

consumers. Thus, the researchers in this study have analyzed the factors associated with the intention to quit smoking with the aim to contribute to the strengthening of all initiatives to quash this ignominious habit of smoking among the general mass. It is worthwhile to mention that very few such studies have been done in this part of the country and almost none in rural West Bengal.

## SUBJECTS AND METHODS

### Study type and setting

A community-based observational study with cross-sectional design was conducted from June to September 2019 among

**Address for correspondence:** Dr. Pritam Ghosh,  
Gents Hostel, All India Institute of Hygiene and Public Health 50, Colootolla  
Street, Kolkata - 700 073, West Bengal, India.  
E-mail: pg0072001@gmail.com

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**How to cite this article:** Dasgupta A, Ghosh P, Paul B, Roy S, Ghose S, Yadav A. Factors associated with intention and attempt to quit: A study among current smokers in a rural community of West Bengal. *Indian J Community Med* 2021;46:216-20.

**Received:** 04-04-20, **Accepted:** 01-03-21, **Published:** 29-05-21

### Access this article online

Quick Response Code:



Website:  
www.ijcm.org.in

DOI:  
10.4103/ijcm.IJCM\_214\_20

male current smokers at Singur in the rural field practice area of All India Institute of Hygiene and Public Health (AIHH and PH). All current daily smokers who were residing for at least 1 year were included. Those who did not provide informed written consent were excluded.

### Sampling

GATS 2 revealed that 38.8% of male smokers attempted to quit in last 12 months.<sup>[14]</sup> Now taking expected prevalence (P) as 0.388,  $Q = 1 - P$ , absolute error (L) = 10% and standard normal deviate in 95% confidence interval ( $Z_{1-\alpha}$ ) = 1.96, calculated sample size was  $91.22 \approx 92$  as per  $(Z_{1-\alpha})^2 \times (P \times Q/L^2)$  formula. As cluster sampling was done, design effect of 2 was used, and the minimum sample size calculated was 184.

Eighteen clusters were selected, so number of subjects per cluster was  $184 \div 18 = 10.1 \approx 11$ . Therefore, total  $18 \times 11 = 198$  current daily smokers were included in this study.

The study area consisted of 64 villages. Population list of those villages was obtained and 18 villages were selected as clusters by probability proportional to population size technique.

On the day of survey, investigators went to the center of selected village and randomly chose a direction. In that direction, one house was chosen randomly. If a current smoker was present in that house, the house was taken as the first house, and subsequent houses were visited continuously till 11 current smokers had been covered. The same procedure was followed in all the 18 clusters.<sup>[15]</sup>

### Data collection and analysis

Ethical approval was taken from the Institutional Ethics Committee of AIHH&PH prior to the data collection. After obtaining informed written consent, interview of the study participants was conducted using a predesigned pretested Bengali schedule. Validity of the instrument was evaluated by the experts of AIHH&PH, this schedule comprised of the following.

#### Dependent variable

Intention and attempt to quit.

#### Independent variables

Background characteristics, smoking behavior, potential influencer and barriers to smoking cessation, and nicotine dependence.

Nicotine dependence was assessed with modified Fagerstrom Nicotine Dependence Scale (FNDS) comprising of six items.<sup>[16]</sup> FNDS score of  $\leq 4$  was taken as low dependence and score of  $>4$  was termed as medium-to-high nicotine dependence.

Data were analyzed using Microsoft Excel 2016 and Statistical Package for the Social Sciences (SPSS for Windows, version 16.0, SPSS Inc., Chicago, Illinois, USA) software. Descriptive and inferential statistics including univariate and multivariable logistic regression were performed. Level of statistical significance was defined as  $P < 0.05$ . Biologically plausible variables which were statistically significant in the

univariate models were included in the final multivariable model.

## RESULTS

The mean age of study participants was  $47.8 \pm 13.6$  years. Nearly one-fourth 58 (29.3%) of them had no formal education with mean years of schooling of  $5.4 \pm 4.4$  years. About half 85 (43%) of the participants were involved in agriculture and 84% (42.9) belonged to Class IV socioeconomic class (Modified B. G. Prasad Scale 2019).<sup>[17]</sup>

Out of all, 81 (41%) commenced to smoke during adolescence. Concurrent use of smokeless tobacco was noted in 41 (20.7%) of the participants. Around 151 (76.3%) showed intention to quit though only 63 (31.8%) attempted to quit in the last 1 year. Half of the attempters 31 (49.2%) had attempted only once in the last year and only 8 (12.6%) attempted more than thrice. Most of the attempters 40 (63.5%) succeeded to hold quitting period for less than a month, only 22 (11.1%) had quitting period  $>3$  months. Around half of the participants (47.5%) had medium to high nicotine dependence. [Table 1].

Majority 171 (85.9%) knew about the harmful effects of smoking. Most of them 156 (78.8%) received medical advice for smoking cessation and 133 (67.2) observed advertisement on cessation of smoking in the last month. More than half 113 (57.1%) had family pressure to quit smoking. One-fourth 48 (24.2%) had respiratory problems such as shortness of breath, cough, and chest pain.

In univariate model, significant association of intention to quit was seen with agriculture as occupation, low nicotine dependence, doctor's advice, and family pressure [Table 2]. In multivariable model, all variables maintained their significant association. This model was fitting well evident from insignificant result in Hosmer-Lemeshow test and

**Table 1: Distribution of participants according to smoking behaviour and nicotine dependence (n=198)**

| Variables   | Descriptive statistics |
|---|------------------------|
| Smoking behaviour, median (IQR)                           |                        |
| Age at initiation (years)                                 | 20 (16-26)             |
| Daily consumption of smoking units (units/day)            | 10 (8-20)              |
| Duration of smoking (years)                               | 25 (15-36)             |
| Monthly expenditure on smoking (₹)                        | 100 (30-300)           |
| Nicotine dependence, frequency, n (%)                     |                        |
| First smoking within 5 min after awakening                | 65 (32.8)              |
| Difficulty to refrain from smoking in forbidden places    | 97 (49)                |
| Displeasure to give up first smoking in the morning       | 100 (50.5)             |
| Higher frequency of smoking in first hours of the morning | 80 (40.4)              |
| Smoking even being bedridden                              | 75 (37.9)              |
| Nicotine dependence (FTND score)                          |                        |
| Low   | 104 (52.5)             |
| Medium to high  | 94 (47.5)              |

FTND: Fagerstrom test for nicotine dependence, IQR: Interquartile range

11.8%–17.8% variability of dependent variable was explained by this model by Cox and Snell and Nagelkerke  $R^2$  [Table 3].

In univariate model, attempt to quit was significantly associated with low nicotine dependence and family pressure [Table 2]. In multivariable model, both of them maintained their significance. This model was fitting well evident from insignificant result in Hosmer-Lemeshow test and 17%–23.9% variability of dependent variable was explained by this model by Cox and Snell and Nagelkerke  $R^2$  [Table 3].

## DISCUSSION

Median age at initiation of smoking was 20 years in the current study which was comparable with the findings in GATS 2 India report, Khan *et al.* in rural Haryana and Rushender *et al.* in rural Tamil Nadu.<sup>[14,18,19]</sup> It is very alarming that substantial portion of our participants started smoking during their adolescence, when their decision-making ability is poor. Hence, youth-centered, innovative, age-appropriate social, and behavioral change communication strategies are necessary to prevent the adolescent from acquiring this dangerous practice as well as to increase the quitting behaviour at an early age. Medium to high nicotine dependence was observed in half of the participants in our study which is comparable with the findings of other studies.<sup>[19-21]</sup> This discordance with the

findings of our study may be attributed to different study design and study population.

In our study, 76.3% of male daily smokers intended to quit smoking. GATS 2 found that 56.3% of male smokers intended to quit.<sup>[14]</sup> Similar proportion of intenders for smoking cessation were observed in studies by Khan *et al.* (52.4%), Rushender *et al.* (46%), and Dasgupta *et al.* (43.1%).<sup>[18-21]</sup> We found more intenders probably due to higher frequency of awareness campaigns against tobacco for the last few years. However, only one-third (31.8%) of male smokers in the rural area showed attempt to quit in our study, similar to GATS 2 (38.8%).<sup>[14]</sup> Casado *et al.* showed that most (65.6%) of smokers made a quit attempt.<sup>[22]</sup> Majority of smoke-free intervals during those attempts in our study not lasted for long and eventually failed. These disparities between intentions and attempt to quit clearly indicate a pertinent gap between the smokers' perception and practice, which again can be reduced through proper counseling and intensive deaddiction strategies.

This study showed no association of intention or attempt to quit with age. Islam *et al.* and Kaai *et al.* showed that younger age was associated with intention and attempt to quit.<sup>[23-25]</sup> In our study, intention to quit and attempt to quit were not associated with education. Most of the studies showed that higher education was associated with intention to quit and

**Table 2: Univariate logistic regression for determinants of intention and attempt to quit smoking ( $n=198$ )**

| Variables                                  | Intention to quit (OR, P) | Attempt to quit (OR, P) |
|--|---------------------------|-------------------------|
| Age $\geq 50$ years                        | 1.30, 0.44                | 1.77, 0.06              |
| Education: Above primary                   | 1.14, 0.69                | 1.11, 0.75              |
| Occupation: Agriculture                    | 2.38, 0.02                | 1.09, 0.77              |
| Per-capita income $< ₹2000$                | 1.05, 0.88                | 1.45, 0.23              |
| Age at initiation $> 19$ years             | 1.93, 0.05                | 1.31, 0.39              |
| Duration of smoking $\geq 25$ years        | 1.69, 0.12                | 1.44, 0.23              |
| Frequency of smoking $\geq 10$ units/day   | 1.12, 0.74                | 1.38, 0.32              |
| Monthly expenditure on smoking $\geq ₹100$ | 1.28, 0.46                | 1.52, 0.17              |
| Low nicotine dependence                    | 2.46, $< 0.01$            | 5.59, $< 0.01$          |
| Knowledge on harms of smoking: Present     | 1.99, 0.10                | 1.85, 0.20              |
| Doctor's advice on quit smoking: Present   | 2.48, 0.01                | 1.43, 0.33              |
| Family pressure on quit smoking: Present   | 2.43, $< 0.01$            | 2.75, $< 0.01$          |
| Advertisement on quit smoking: Seen        | 1.37, 0.36                | 1.33, 0.38              |
| Concurrent SLT use: Present                | 1.05, 0.9                 | 1.49, 0.27              |
| Respiratory problem: Present               | 1.09, 0.81                | 1.24, 0.54              |

SLT: Smokeless tobacco, OR: Odds ratio

**Table 3: Multivariable logistic regression model: predictors of intention to quit and attempt to quit ( $n=198$ )<sup>†</sup>**

| Variables                | Model 1<br>Intention to quit |          | Model 2<br>Attempt to quit |          |
|--------------------------|------------------------------|----------|----------------------------|----------|
|                          | AOR (95% CI)                 | P        | AOR (95% CI)               | P        |
| Occupation: Agriculture  | 2.17 (1.01-4.63)             | 0.04     | -                          | -        |
| Low nicotine dependence  | 2.98 (1.43-6.21)             | $< 0.01$ | 5.85 (2.85-12.00)          | $< 0.01$ |
| Family pressure: Present | 2.16 (1.07-4.38)             | 0.03     | 2.94 (1.47-5.91)           | $< 0.01$ |
| Doctor's advice: Present | 2.84 (1.27-6.33)             | 0.01     | -                          | -        |

<sup>†</sup>Model fitting is good (Hosmer and Lemeshow test P value were 0.96 and 0.99 for model 1 and 2 respectively). Nagelkerke and Cox and Snell  $R^2$  for model 1 were 0.178 and 0.118. Nagelkerke and Cox and Snell  $R^2$  for model 2 were 0.239 and 0.170. CI: Confidence interval, AOR: Adjusted odds ratio

attempt to quit.<sup>[18,20,22,25]</sup> Farmers had more intention to quit in the present study. In a meta-analysis by Nargis *et al.* showed that nonemployment was associated with intention to quit in low- and middle-income countries.<sup>[26]</sup>

In our study, intention to quit had no association with age of initiation. In other studies, older age of initiation predicted intention to quit.<sup>[18,23]</sup> Khan *et al.* found that higher monthly expenditure was associated with intention to quit, while we found no such association.<sup>[18]</sup> Smokers who intended or attempted to quit had low nicotine dependence in this study in consistent with the findings in other studies.<sup>[20,22,23,24]</sup> In the current study, advice from health-care providers improved intention to quit significantly, but it was not associated with attempt to quit.<sup>[18]</sup> However, Khan *et al.* and Srivastava *et al.* showed that health-care providers' advice was associated with intention and attempt to quit.<sup>[25]</sup> In parallel to public sector, private sector of health care has a potential role in this regard.

Influence of family was an important predictor of intention and attempt to quit in the current study. Chawla *et al.* found no such influence of family pressure on smoking cessation, but other studies supported our finding.<sup>[27-30]</sup> Advice from health personnel always play a very important role in mitigating smoking habit, but the role of family members in this mission is definitely much more momentous and noteworthy. Obviously with the initial spurt of doctors' advice, the smokers hurriedly build up intention to quit, but their attempt wanes quite rapidly, and the smokers push themselves to square one as they restart to smoke.

To enable the family members to assume this role, appropriate IEC materials targeted to build their capacity for providing sustainable influence for quitting should be formulated.

All these will help in reducing the use of tobacco to a large extent among the general mass along with a sharp fall in their morbidity and mortality and in the long run will evoke a major cut in the medical expenses at the national level, thus tellingly easing the pressure borne by health system.<sup>[31,32]</sup> Delivery of anti-tobacco services leveraged on Ayushman Bharat program through primary health-care system is the need of the hour.<sup>[31-33]</sup>

### Limitation and strength

The study had certain limitations. Data collected through interview of study participants were subjected to recall bias, particularly in questions related to past events. Intention to quit was judged by a single question having yes/no options, in which cases respondents might have given socially desirable responses. So, instead of a single question it would have been better if attitude had been elicited by a set of relevant questions which would as a whole give an elaborate assessment of attitude to quitting. Ex-smokers were not included in our study. Hence, the factors resulting in successful attempts could not be elicited. Moreover, directionality of the relationship between the explanatory variables with the outcomes could not be established due to the cross-sectional design. The sample size was not adequate to enable the researchers to conduct subgroup

analysis according to age, education, and nicotine dependence. Longitudinal studies with a larger sample size will certainly bring forth more precise and representative result.

However, the current study had several strengths such as its community-based design with the use of robust sampling methods which ensured the generalization of the results. Nicotine dependence, which was an important proximate variable of quitting behavior, was also assessed using a validated FNDS tool.

## CONCLUSION AND RECOMMENDATION

To combat the menace of high nicotine dependence, setting up of decentralised, well-equipped, de-addiction counseling clinics are crucial. Implementation of such policy under the able guidance of NTCP to meet some of the present-day challenges is the need of the hour. The health and wellness centers, which are cognizant and very much focussed to tackle with the emerging burden diseases, can be utilized to reduce nicotine dependence burden. Primary health cadres like the Auxiliary Nurse Midwives, Anganwadi Workers and the ASHAs should be empowered with lucid and updated knowledge regarding the harmful effects of smoking and techniques of conducive and effective counselling so that they can preach, propagate, and proliferate the message of quitting tobacco among family members. Family level motivation will increase the quitting behaviour among beneficiaries. Thus, together we can build a strong societal will power to quit smoking followed by eradication of the tobacco epidemic.

### Acknowledgment

We want to convey our gratitude to Director, All India Institute of Hygiene and Public Health to permit us to conduct this study. We also acknowledge the support of health functionaries of Rural Health Unit and Training Center, Singur under AIIHPH for their untiring support.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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